

REMARKS

In the Office Action dated November 15, 2002, informalities were noted in claims 4, 7 and 19. Claims 4 and 19 have been amended to correct those informalities. Claim 7 has been cancelled because the subject matter thereof is adequately covered in claim 16.

Claims 3, 4, 6, 8, 10-15, 17 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka in view of Kroener. Applicants note with appreciation the interview courteously afforded the undersigned counsel for the Applicants on January 14, 2003. This interview was conducted by telephone on that date.

In the November 15, 2002 Office Action, the Examiner stated that the Tanaka reference discloses, among other things, a first ring-like heat exchanger. The Examiner cited Figure 6 and 7 in the Tanaka reference in substantiation of this position. As discussed at the interview, the term "ring-like" was intended in the present application to mean circular or annular, and Applicants do not find any showing in Figures 6 and 7 of Tanaka, or any discussion in the written portion of that reference, with regard to a circular or annular heat exchanger. At the interview, the Examiner stated he did not necessarily equate the term "ring-like" with "circular" or "annular," and therefore it was agreed at the interview to amend the independent claims to employ the term "annular" at all locations in place of ring-like.

It is therefore clear that the Tanaka reference does not disclose or suggest any type of annular heat exchanger.

Independent claim 1 of the present application requires first and second heat exchangers, both of which are annular. Independent claim 17 requires only that the

first heat exchanger be annular, and is non-specific as to the structure of the second heat exchanger. Independent claim 20 similarly requires only that the first exchanger be annular, and is non-specific as to the structure of the second heat exchanger, but includes the further limitation of the second heat exchanger being stationary.

As also discussed at the interview, the Kroener reference does not disclose an annular heat exchanger. There are three heat exchangers disclosed in the Kroener reference, namely the heat exchanger 9 and the two heat exchangers designated 27. None of those heat exchangers is annular. As discussed at the interview, there is an annular circulation path disclosed in the Kroener reference. The circulation path 16 in the Kroener reference proceeds within the annular channel 14. This circulation path, however, is not a heat exchanger, and is not referred to as such in the Kroener reference. The circulation path 16 is just that -- a circulation path which allows communication between two heat exchangers, but it is not itself a heat exchanger. As described at column 3, beginning at line 45 in the Kroener reference, the conduit 16 is disposed within the annular channel 14. The opposite free ends of the conduit 16 are respectively connected to an inlet 17 and an outlet 18 of the circulation loop 10. It is further stated in this passage of the Kroener reference that the heat arising in the closed housing of the X-ray source 4 is conducted to the heat exchanger 9 by the coolant that flows through the housing of the X-ray source 4, and is transmitted to the coolant of the loop 10 via the heat exchanger 9. It is then stated in the Kroener that in the annular channel 14, this heat is transmitted to the coolant, such as air, that flows through the annular channel 14. As stated in the

paragraph beginning at column 4, line 1 in Kroener, the cooling air flowing in the annular channel 14 is conducted through heat exchangers 27.

Therefore, the Kroener reference clearly differentiates between the heat exchangers 9 and 27, and the conduit 16. The conduit 16 merely serves as a conveyance for transmitting the heat from the heat exchanger 9 to the heat exchangers 27, but as stated above, is not itself a heat exchanger. Therefore, despite the conduit 16 having an annular shape, there is no annular heat exchanger disclosed or suggested in Kroener.

In fact, the Kroener reference is evidence supporting patentability, rather than negating patentability. The Kroener reference teaches the use of three non-annular (conventional) heat exchangers, and requires an annular conduit to transmit heat from the heat exchanger 9 to the exchangers 27. The Kroener reference therefore teaches a person of ordinary skill in the art to employ an annular conduit, with conventional heat exchangers, rather than providing any teaching to employ an annular heat exchanger, as disclosed and claimed in the present application.

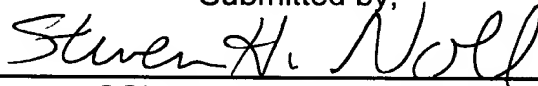
Therefore, even if the Tanaka reference were modified in accordance with the teachings of Kroener, an X-ray examination arrangement or tomography apparatus having an annular heat exchanger still would not result. Moreover, as to claim 8, it is even clearer that the Tanaka/Kroener reference does not disclose or suggest the use of two annular heat exchangers, as set forth in claim 8.

Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka in view of Kroener, further in view of Deucher et al., however, in view of the cancellation of claim 7 that rejection is moot.

Applicants note with appreciation the indication that claims 16, 19 and 21 would be allowable if rewritten in independent form, however, in view of Applicants' belief that independent claims 8, 17 and 20 are patentable over the references relied upon by the Examiner, those claims have been retained in dependent form at this time.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Submitted by,



(Reg. 28,982)

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend claim 4 as follows:

4. (Twice amended) The improvement of claim 8 wherein said first heat exchanger has a flow path therein, and further comprising a heat transfer medium flowing through said first heat exchanger in said flow path.

Please amend claim 8 as follows:

8. (Amended) In an X-ray examination arrangement having an X-ray source mounted at a gantry which is rotatable around a rotational axis, the improvement of a cooling arrangement for said X-ray source comprising:

- a first [ring-like] annular heat exchanger disposed at said gantry and in thermally conductive connection with said X-ray source; and
- a second [ring-like] annular heat exchanger disposed in a thermally conductive, annular path with said first heat exchanger, with said first heat exchanger transferring heat from said X-ray source to said second heat exchanger directly via said annular path, said second heat exchanger being stationary relative to said first heat exchanger.

Please amend claim 17 as follows:

17. (Three times amended) A computed tomography apparatus comprising:

- a gantry rotatable around a rotational axis;
- an X-ray source and an X-ray detector mounted opposite to each other on said gantry, said X-ray source emitting heat during operation thereof;

a first [ring-like] annular heat exchanger disposed at said gantry having at least two heat exchange elements thermally conductively connected to each other, with at least one of said heat exchange elements being thermally conductively connected to said X-ray source for transferring said heat from said X-ray source; and

a second heat exchanger disposed in a thermally conductive path relative to said first heat exchanger, with said first heat exchanger transferring heat from said X-ray source to said second heat exchanger directly via said thermally conductive path and said second heat exchanger [for] transferring said heat transferred from said first heat exchanger to an exterior of said gantry.

Please amend claim 19 as follows:

19. (Twice amended) A computed tomography apparatus as claimed in claim [19] 17, wherein said first heat exchanger is rotatable around said rotational axis together with said gantry, and further comprising a plurality of inter-engaging annular guide devices for guiding an airstream, generated by rotation of said first heat exchanger and heated at said first heat exchanger, from said first heat exchanger to said second heat exchanger.

Please amend claim 20 as follows:

20. (Twice amended) A computed tomography apparatus comprising:
a gantry rotatable around a rotational axis;
an X-ray source and an X-ray detector mounted opposite to each other on said gantry, said X-ray source emitting heat during operation thereof;

a first [ring-like] annular heat exchanger disposed at said gantry and thermally conductively connected to said X-ray source; and

a second heat exchanger disposed in a thermally conductive path with said first heat exchanger, with said first heat exchanger transferring heat from said X-ray source to said second heat exchanger directly via said thermally conductive path, and said second heat exchanger being stationary relative to said first heat exchanger.

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